

Geel 2000 Language Schools

Math Department

First Term

Prep 3

2024/ 2025

Unit One

Relations and functions

- Lesson one : Cartesian product
- Lesson two : Cartesian product of the infinite sets and its graphical representation
- Lesson three: relation – function (mapping)
- Lesson four : The symbolic representation of the function – polynomial functions
- Lesson five : The study of some polynomial functions

Lesson 1 **On Cartesian product**

1) Find the values of a and b in each of the following if :

1. $(a\ ,b\ ) = (\sqrt{25},\ \sqrt[3]{27}\ )$
2. $(\ a^2\ ,1\ ) = (\ 36\ ,b^5\ )$
3. $(2\ a\ ,7\ ) = (\ 2\ b + 1\ ,a\ )$

2) If x = {5} , Y = { 2 , 7}

1. X x Y and represent it by an arrow diagram.
2. X x Y and represent it by Cartesian diagram.

3) If X = {3 , 4 , 8 } Find X x X and represent it :

- By an arrow diagram.
- By Cartesian diagram.

4) Complete the following:

1. $If\ X = \{1, 2, 3\}, Y = \{4\}, then\ X \times Y =$ ....
2. $If\ X = \{5, 6\}, Y = \{a\}, then\ Y \times X =$ ....
3. $If\ X = \{1, 2\}, then\ X \times \emptyset =$ ....
4. $\{2, 3\} \times \{4, 5\} =$ ....
5. $\{0\} \times \{2, 3\} =$ ....
6. $If\ (1, 5) \in X \times Y\ then\ 1 \in$ ...., $5 \in$ ....
7. $\{(5, 7)\} =$ .... x ....

5) Choose the correct answer from those given :

1. $If\ n(X^2) = 4, n(X \times Y) = 8, then\ n(Y^2) =$ ....

   (a) 1 (b) 4 (c) 16 (d) 64

2. $If\ X = \{3, 4\}, then\ n(X \times \emptyset) =$ ....

   (a) $Zero$ (b) 1 (c) 2 (d) $\emptyset$

3. $If\ (3, 5) \in \{3, 6\} \times \{x, 8\}, then\ x =$ ....

   (a) 8 (b) 6 (c) 5 (d) 3

Lesson 2 **Cartesian product of the infinite sets and its graphical representation**

1) Choose the correct answer from those given :

1. $The\ point$ (……… , ……….) lies on the second quadrant.

   (a) (3, 2) (b) (-2 , 3) (c) (-3 , -2) (d) (2 , -3)

2. $If\ the\ point$ (x , 2) lies on $y-axis, then\ x =$ …………...

   (a) $Zero$ (b) 1 (c) 2 (d) 3

3. $If\ the\ point$ (-4 , y) lies on the $x-axis$, $then\ 2y-1=$………

   (a) -1 (b) 1 (c) -8 (d) -9

4. $If\ the\ point$ (a, b) lies on the fourth quadrant , then a.b ……zero

   (a) $=$ (b) $>$ (c) $<$ (d) $\geq$

5. $If\ the\ point$ ($2a$, $3b$) $\in \overleftrightarrow{xx'}$, $then\ \frac{b}{a} =$ ………

   (a) $Zero$ (b) $\frac{2}{3}$ (c) 2 (d) 3

6. $If\ the\ point\ (x-2, x-4)\ lies\ on\ the\ fourth\ quadrant, then\ x =$ ………
   where $x \in \mathbb{Z}$ (a) $Zero$ (b) 2 (c) 3 (d) 4

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2) If A (-2 , 0) , B (-2 , 3) , C (2 , 3) identify on the perpendicular square net R^2 the points A, B , C and find the area of Δ ABC

Lesson 3 **On relation – function (mapping)**

1) **Choose the correct answer from those given :**

1. $If\ f\ is\ a\ function\ from\ the\ set\ X\ to\ the\ set\ Y\ , then: X\ is\ called\ldots\ldots\ldots$

   $(a) the\ range\ of\ the\ function\ f$ $(b) the\ domain\ of\ the\ function\ f$

   $(c)\ the\ codomain\ of\ the\ function\ f$ $(d) the\ rule\ of\ the\ function\ f$

2. $If\ f\ is\ a\ function\ from\ the\ set\ X\ to\ the\ set\ Y\ , then: Y\ is\ called\ldots\ldots\ldots$

   $(a) the\ range\ of\ the\ function$ $(b) the\ domain\ of\ the\ function$

   $(c)\ the\ codomain\ of\ the\ function$ $(d) the\ rule\ of\ the\ function$

3. If R is a function where R= $\{(1,3),(2,\ 5),(\ 4\ ,7\ )\}$, $then\ its\ range\ is\ldots\ldots\ldots$
   (a) $\{1,2,\ 4\}$ (b) $\{2,4,7\}$ (c) $\{3,5,7\}$ (d) $\{1,3,5\}$

4. If R is a function from X to Y where X= $\{\ 2,\ 4,5\}$, $Y = \{6,7\}\ and$
   $R = \{(2,6),(a,6),(5,6)\}, then\ a = \ldots\ldots\ldots\ldots$
   (a) 4 (b) 5 (c) 12 (d) 6

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2) If X = $\{3,4,5\}$, $Y = \{4,6,8,10\}\ and\ R\ is\ a\ relation\ from\ X\ to\ Y\ where$ "$a\ R\ b$" means "$a = \frac{1}{2}\ b$" for each a $\in X$, $b \in Y$
Write the set of the relation R and show that R is a function, then write its range.

3) If X = { 1, 2, 3 } , $Y = \{1, 3, 6, 9, 12\}$ $and\ R\ is\ a\ relation\ from\ X\ to\ Y\ where$ "$a\ R\ b$" means "$a = \frac{1}{3}\ b$" for each a $\in X$, $b \in Y$

Write R and show that R is a function, then write its range.

4) If X = { 4, 6, 8,10 } , $Y = \{2, 3, 4, 5\}$ $and\ R\ is\ a\ relation\ from\ X\ to\ Y\ where$ "$a\ R\ b$" means "$a = 2\ b$" for each a $\in X$, $b \in Y$

Write R and represent it by an arrow diagram.

5) If X = { 1, 2, 3 } , $Y = \{1, 2, 4, 6, 9\}$ $and\ R\ is\ a\ relation\ from\ X\ to\ Y\ where$ "$a\ R\ b$" means "$a^2 = b$" for each a $\in X$, $b \in Y$

- Write R and represent it by an arrow diagram.
- Is R a function ? Why ?

Lesson 4 **On the symbolic representation of the function – polynomial function**

1) Choose the correct answer from those given :

1. $The\ function\ f\ where\ f(x) = 6x^7 + 2x^5 - 4x + 1$
   $is\ a\ polynomial\ function\ of$ …………. $degree.$
   (a) First (b) fifth (c) sixth (d) seventh
2. $The\ function\ f\ where\ f(x) = 2x - 3x^4 + 1$
   $is\ a\ polynomial\ function\ of$ …………. $degree.$
   (a) First (b) second (c) third (d) fourth
3. $The\ function\ f: f(x) = (x - 5)^3$ $is\ a\ polynomial\ function\ of$ …………. $degree.$
   (a) Zero (b) second (c) third (d) fourth
4. $The\ function\ f: f(x) = x(x - 2x^2)$ $is\ a\ polynomial\ of\ the$ …………. $degree.$
   (a) first (b) second (c) third (d) fourth
5. $The\ function\ f: f(x) = x^2(x - 3)^2$ $is\ a\ polynomial\ of\ the$ ………….
   $degree.$
   (a) first (b) second (c) third (d) fourth
6. $If: f(x) = x^3 - 1, then\ f(1) =$ ……………..
   (a) Zero (b) 2 (c) -2 (d) 1
7. $If: f(x) = a x + 6, f(2) = 2, then\ a =$ ……………..
   (a) 2 (b) -2 (c) 4 (d) 6
8. $If: X = \{2, 4, 6\}, n(Y) = 4\ and\ the\ function$
   $f: X \longrightarrow Y, f(x) = x^2 - 1, then\ Y\ may\ equal$ ……………
   (a) $\{3, 7, 13\}$ (b) $\{3, 15, 25, 45\}$
   (c) $\{3, 15, 35\}$ (d) $\{3, 15, 25, 35\}$

2) Which of the following functions represents a polynomial function :

1. $f: f\ (x) = 2x - 5$
2. $f: f\ (x) = 3$
3. $f: f\ (x) = x + \frac{1}{x}$
4. $f: f\ (x) = x^3 + x^2 + 3$
5. $f: f\ (x) = x^2 + \sqrt{x} + 8$
6. $f: f\ (x) = x\left(x + \frac{1}{x} - 2\right)$
7. $f: f\ (x) = \sqrt[3]{x} + 8$
8. $f: f\ (x) = x\,(x^2 + x^{-2} - 4)$

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3) If : $\boldsymbol{f\ (x) = 2x - 1\ , prove\ that : f\ (2) - 3\ f\ (1) = Zero}$

Lesson 5

On some polynomial functions

1) Complete the following :

1. $The\ function\ f: \mathbb{R} \longrightarrow \mathbb{R}$
   $where\ f\ (x) = 5\ is\ represented\ by\ a\ straight\ line\ parallel\ to$ ………………
   $and\ intersects\ y - axis\ at\ the\ point$ ……………
2. $The\ x - axis\ is\ the\ graphical\ representation\ of\ the\ function\ f: \mathbb{R} \longrightarrow \mathbb{R}$
   $where\ f\ (x) =$ ………
3. $If\ f\ (x) = -3, then : f\ (0) =$ ………….. $where\ f\ (x) =$ ………
4. $If\ f\ (x) = 3, then\ f\ (5) + f\ (-5) =$………….
5. $If\ f\ (x) = 5, then\ \frac{f(5)}{f(10)} =$ ………
6. $The\ linear\ function\ given\ by\ the\ rule\ y = 2x - 1$
   $is\ represented\ graphically\ by\ a\ straight\ line\ intersecting\ the$
   $y - axis\ at\ the\ point$ ………
7. $The\ straight\ line\ which\ represents\ the\ function\ f : \mathbb{R} \longrightarrow \mathbb{R}$
   $where\ f\ (x) = 5x - a\ intersects\ the\ y - axis\ at\ the\ point\ (b, 2), then$
   $a =$………….. $and\ b =$ ……………….
8. $The\ Curve\ of\ the\ quadratic\ function\ has\ a\ maximum\ value\ if\ the\ sign$
   $of\ the\ coefficient\ of\ x^2\ is$ ………….
   $and\ has\ a\ minimum\ value\ if\ the\ sign\ of\ the\ coefficient\ of\ x^2\ is$ …………
9. $If\ the\ curve\ of\ the\ quadratic\ function\ which\ is\ defined\ on\ \mathbb{R}$
   $has\ a\ maximum\ value\ then\ this\ curve\ is\ opened$ ……………
10. $The\ equation\ of\ the\ axis\ of\ symmetry\ of\ the\ function\ f: f\ (x) = x^2\ is$ ………
11. $As\ representing\ f: f\ (x) a\ x^2 + b\ x + c\ , where\ a \in \mathbf{R}^*, then\ the$
    $x - coordinate\ of\ the\ vertex\ of\ the\ curve =$ ……………….
12. $The\ point\ of\ the\ vertex\ of\ the\ curve\ of\ the\ function$
    $f: f\ (x) = 2\ x^2 - 4\ x + 5\ is$ ………………….
13. $If\ the\ curve\ of\ the\ function\ f\ such\ that$
    $f\ (x) = x^2 + c\ passing\ through\ the\ point\ (0\ , 2), then : c =$…………….
14. $If\ (-2, y\ ) belongs\ to\ the\ curve\ of\ the\ function\ f : f\ (x) = x^2 + 1$
    $, then : y =$…………….

2) *Represent each of the following linear functions graphically and find the point of intersection of the straight line which represents each of them with the coordinate axes , where* $x \in \mathbb{R}$:

1. $f : f\ (x) = -\ x$
2. $f : f\ (x) = 2x - 3$

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3) *Represent each of the following functions graphically and from the graph, deduce the coordinate of the vertex of the curve and the equation of the line of symmetry and the maximum or minimum value of the function, where* $x \in \mathbb{R}$:

1. $f : f\ (x) = x^2 +\ 1\ taking\ x\ \in\ [-3, 3\ ]$

2. $f : f\ (x) = x^2 -\ 2x\ taking\ x\ \in\ [-2\ , 4\ ]$

Unit Two

Ratio, Proportion, direct variation and inverse variation

- **Lesson one : Ratio and proportion**
- **Lesson two : Follow properties of proportion**
- **Lesson Three : Continued proportion**
- **Lesson Four : Direct variation and inverse variation**

Lesson 1

On The ratio and proportion

1) Complete the following :

1. The proportion …………….
2. If a, b, c and d are proportional quantities, then c is called …………
3. If the quantities a, b, c, and d are proportional, then : $\frac{a}{b}$ = …………..
4. The fourth proportional for the numbers 4, 12 and 16 is …………….
5. The second proportional for the numbers 8, 6 and 12 is ……………...
6. If 3, 4, x and 11 are proportional, then : x = …………….
7. If 3, a-1 , a+1 and 5 are proportional , then : a= ……………..
8. A sum of money is divided between two persons with the ratio 2 : 3
If the share of the first is L.E 30 , then the share of the other is L.E …………….
9. If 7 x = 3 , then : $\frac{x}{y}$ = …………..
10. If 5 a - 4 b = 0 , then : $\frac{a}{b}$ = …………..
11. If $\frac{5a-7b}{8a+11b}$ = 0 , then : $\frac{b}{a}$ = …………..
12. If $9a^2 - 25b^2 = 0$ where a ∈ $\mathbf{R}^+$ and b ∈ $\mathbf{R}^+$, then : $\frac{a}{b}$ = …………
13. If $\frac{x}{y} = \frac{2}{5}$, then : $\frac{2x}{2y}$ = …………

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2) Find the value of x in each of the following , if :

1. $(2x-3):(x-5) = 1:4$

2. $(x^2-8):(2x^2+1) = 1:3$

3) $If\ \frac{x+3\ y}{2\ x-y} = \frac{3}{4}\ , find\ the\ ratio\ \ x : y$

4) $If\ x^2 - 4\ y^2 = 3\ x\ y\ \ , find\ x : y$

5) $If\ \ 3x^2 - 10\ xy + 7\ y^2 = 0\ ,\ \ x\ \neq y\ , find\ the\ ratio\ \ x : y$

6) $If\ \frac{a}{b} = \frac{3}{4}\ , then\ find\ the\ value\ of\ :$

- $\frac{4\ a+b}{2\ a-b}$

7) $Find\ the\ number\ which\ is\ subtracted\ from\ \ each\ of\ the\ following$ $numbers\ to\ be\ proportional\ \ 16, 21\ , 14\ and\ 18\ .$

8) Prove that : a, b, c and d are proportional quantities if :

$$\frac{a}{a-b} = \frac{c}{c-d}$$

Lesson 2

On properties of proportion

1) Complete the following :

1. $If\ \frac{a}{b} = \frac{c}{d} = \frac{3}{5}\ , then:\ \frac{a+c}{b+d} = \ldots\ldots\ldots\ldots\ldots\ldots$
2. $If\ \frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{3}{5}, then:\ \frac{a-2c+e}{b-2d+f} = \ldots\ldots\ldots\ldots\ldots\ldots$
3. $If\ \frac{x+y}{5} = \frac{y+e}{3} = \frac{e+x}{6}, then:\ \frac{x-e}{2} = \frac{y-x}{\ldots\ldots\ldots\ldots\ldots\ldots}$
4. $\frac{l}{3} = \frac{m}{8} = \frac{l+\frac{1}{2}m}{\ldots\ldots\ldots\ldots\ldots\ldots}$
5. $If\ \frac{a}{b} = \frac{c}{d} = \frac{e}{f}\ , then:\ \frac{5a+3c+\ldots\ldots\ldots}{5b+\ldots\ldots\ldots+4f} = \frac{a}{b}$

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2) Choose the correct answer from those given :

1. $\boldsymbol{If\ \frac{a}{5} = \frac{b}{7}\ , then: 7a - 5b + 3 = \ldots\ldots\ldots\ldots\ldots}$

(a) 3 **(b) 7** **(c) 5** **(d) 2**

2. $\boldsymbol{If\ \frac{x}{2} = \frac{y}{7} = \frac{2x+y}{a}\ , then: a = \ldots\ldots\ldots\ldots\ldots}$

(a) 9 **(b) 11** **(c) 16** **(d) 5**

3) If a, b , c and d are proportional quantities , prove that :

$$\frac{5a+3c}{5b+3d} = \frac{3a-2c}{3b-2d}$$

4) $If\ \frac{a}{b} = \frac{c}{d} = \frac{e}{f}\ , prove\ that:\ \frac{\boldsymbol{a+5\,c}}{\boldsymbol{b+5\,d}} = \frac{\boldsymbol{c-3\,e}}{\boldsymbol{d-3\,f}}$

5) $If\ \frac{a}{4\,x+y} = \frac{b}{x-4\,y}\ , prove\ that:\ \frac{\boldsymbol{a+b}}{\boldsymbol{5\,x-3\,y}} = \frac{\boldsymbol{a-b}}{\boldsymbol{3\,x+5\,y}}$

6) $If\ \frac{a}{2} = \frac{b}{7} = \frac{c}{3}\ , find\ the\ value\ of\ \frac{a+2\,b}{b-c}$

Lesson 3 — On Continued proportion

1) Find the middle proportion between :

- **3 , 27**
- $2\,a\,,\,8\,a\,b^2$

2) Find the Third proportion of each of the following :

- **6 , 12**

3) If b is the middle proportion between a and c , prove that :

- $\frac{a}{c} = \frac{b^2}{c^2}$
- $\frac{a-b}{b-c} = \frac{a+3\,b}{3\,c+b}$
- $\frac{a+b}{b+c} = \frac{a}{c}$

4) If a , b , c and d are in continued proportion , prove that :

- $\frac{3a+5c}{3b+5d} = \frac{a-4c}{b-4d}$

- $\frac{3a-5c}{a-b+c} = \frac{3b-5d}{b-c+d}$

- $\sqrt[3]{\frac{5a^3-3c^3}{5b^3-3d^3}} = \frac{a+c}{b+d}$

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5) If $\frac{x^2-y^2}{y^2} = \frac{y^2-z^2}{z^2}$, prove that : y is the middle proportion between x and z

Where xz is a positive quantity.

Lesson 4 **On Direct variation and inverse variation**

1) Complete the following :

1. $If\ x \propto y\ then : x =$ ………………

2. If z = $\frac{m}{x^2}$ $where\ m\ is\ a\ constant\ , then\ z \propto$ ………………

3. $If\ y \propto x\ , then :$ $\frac{x_1}{x_2} = \frac{\ldots\ldots\ldots}{\ldots\ldots\ldots}$

4. $If\ x\ varies\ inversely\ as\ y\ , then :$ $\frac{y_1}{y_2} = \frac{\ldots\ldots\ldots}{\ldots\ldots\ldots}$

5. $If\ y = \frac{3}{5}\ x\ , then :\ y \propto$ ……………

6. $If\ y \propto \frac{5}{x}\ , then : y\ varies\ inversely\ as$ ……………

7. $If\ x - 2\,y = 0\ , then : x \propto$ ……………

8. $If\ 2\,x\,y = 5\ , then : x \propto$ ……………

9. $If\ y \propto x\ and\ y = 2\ as\ x = 8\ , then : y =$ …………… when $x = 12$

10. $If\ y \propto \frac{1}{x}\ and\ y = 3\ as\ x = 20\ , then : y =$ …………… when $x = 12$

11. $If\ y \propto x\ and\ y = 2\ as\ x = 4\ , then : y =$ …………… x

2)If y varies directly as x and y = 20 as x= 7

Find : x when y = 40

3) If a varies inversely as b and a = 12 as b = 8 , find :

- *The value of a as* $b = 1.5$
- *The value of b as* $a = 2$

4) ***If*** $y \propto$ ***the multiplicative inverse of the expression*** $\frac{1}{x^2}$ ***, then find the relation between x and y, If y = 4 as x = 3, then : find the value of y as x = 9***

5) If $y^2 \propto x^3$***, find the relation between x and y where*** $y = 3$ ***as*** $x = 2$

6) If: $\frac{a+b}{3} = \frac{2\,b+c}{6}$ ***, then prove that :*** $c \propto a$

7) If : $x^2\,y^2 - 6\,xy + 9 = 0$ ***, then prove that :*** $y \propto \frac{1}{x}$

Unit Three

Statistics

- Lesson one : Collecting data
- Lesson two : Dispersion

Lesson 1 **On collecting data**

1) **Complete the following :**

1. The resources of collecting data are …………… and ……………

2. The personal interview is a …………….. resource of collecting data.

3. The data of the students that are registered in students affair is a …………….. resource of collecting data.

4. Central agency for public mobilization and statistics is a …………….. resource of collecting data.

5. Direct observing is a ……………. resource of collecting data.

6. The suitable method for examining blood of a patient is a ……………

7. The suitable method for checking the production of a factory is ……………..

8. The suitable method to know the population is ………………………

9. The suitable method to know the ratio of absence in one of the schools is ………………..

10. If the society is divided into illiterates , carries of mediate , intermediate and high qualifications , the chosen sample for making a research is called ……………..

2) Choose the correct answer from those given :

1. ………….. is a secondary resources of collecting data.

(a) Personal interview (b) Questionnaires

(c) Data base of the employees (d) Observing and measuring

2. …………..is a primary resource of collecting data.

(a) Central agency for statistics

(b) Data of the school pupils in the previous year

(c) Questionnaires

(d) Data of the employees in one of the companies

3. The method of mass population is suitable for …………………

(a) searching the formation of the sand of the Western Desert.

(b) examining the sweetness of water for one of the wells

(c) finding out the ratio of finding a metal in one of the mines

(d) getting the number of the students who had the full mark in maths exam in a class

4. Choosing a sample from the society's layers in statistics is called a ……… sample.

(a) biased (b) layer (c) international (d) cluster

Lesson 2

On dispersion

1) Complete the following :

1. Dispersion measurements are ……………… and ………………….
2. The simplest measure of the dispersion is ………………….
3. The difference between the greatest value and the smallest value in a set of values is called …………………..
4. The positive square root of the average of squares of deviations of the values from their mean is called …………………
5. If the standard deviation equals zero , then …………………
6. The dispersion to an set equally values equals ………………….
7. The mean of the set of the values : 7 , 5 , 9 , 11 and 3 is …………….
8. The range of the set of the values : 6 , 5 , 9 , 4 and 12 is ……………..
9. If the standard deviation for nine of the values is 3 , then : $\sum \ (x - \bar{x})^2$
For these values is ……………..

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2) Calculate the standard deviation for the next data :

- 16 , 32 , 5 , 20 , 27

3) The following are the frequency distribution for a number of defective units found in 100 boxes of manufactured units:

Number of defective units	**Zero**	**1**	**2**	**3**	**4**	**5**
Number of boxes	**3**	**16**	**17**	**25**	**20**	**19**

Find the standard deviation of the defective units.

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4) The following table represents the daily wages of a set of workers in a factory:

Sets of wages	**20 -**	**30 -**	**40 -**	**50 -**	**60 -**	**70 -**
Number of workers	**10**	**12**	**8**	**6**	**3**	**1**

Find the mean and standard deviation of wages.

Worksheets in Math

Geo. prep (3)

2022/2023

Name:……………………………………………………………………………..

School:……………………………………………………………………………

Class:…… …………………………………………………………………………

Unit 4 objectives

1- Know trignometrical ratios of acute angle

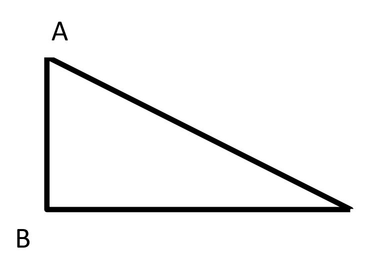
2- Solve exercises which connected with geometric figures

3- Deal with special angles



Trig - Ratios

In the triangle Δ ABC , right in B , AB = 5 Cm , BC = 12 Cm .
Find length of AC ?



Sol :-

AC = $\sqrt{144+25} = 13\ cm.$

Also write rules of

sin A = …$\frac{BC}{AC}$…… sin C =…$\frac{AB}{AC}$…..

cos A = …$\frac{AB}{AC}$…… cos C = ………

tan A = ……….. tan C = ………

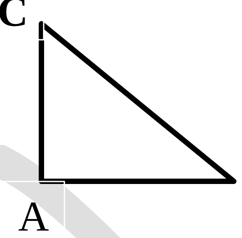
Can you deduce relations between each 2 complementary angles ?

………………………………………………………………………………………………………
………………………………………………………………………………………………………

Think & Answer

Evaluation

1- In △ ABC which is right at A



Prove that : Cos (C) Cos (B) – Sin (C) Sin (B) = 0

……
……
……
……
……
……

2- ABCD is rectangle AB = 15 cm. AC = 25 cm.
Find : tan (ACB) & also find area of rectangle

……
……
……
……
……

Remember that :

1 - $\sin = \frac{opposite}{hypotenuse.}$

2 - $\cos = \frac{adjacent}{hypotenuse}$

3 - $\tan = \frac{opposite}{adjacent}$

Unit :4 **Lesson:** Trig. Ratios of special angles

Learn & Think


1- Find the value of


1- Sin (45°) – Cos (45°) = 0

....

....

2- Sin(30°) + Cos(60°) – tan (45°)

....

....

2 - prove that :

1- $\tan^2 60 - \tan^2 45 = \sin^2 60 + \cos^2 60 + 2\sin 30$

2- $\cos 60 = 2\cos^2 30 - 1$

....

....

....

....

....

1- prove that:

1- $\cos 60 = 2\cos^2 30 - 1$

2- $\tan^2 60 - \tan^2 45 = \sin^2 60 + \cos^2 60 + 2\sin 30$

…………………………………………………………………………………………

…………………………………………………………………………………………

…………………………………………………………………………………………

…………………………………………………………………………………………

2- Find the value of X where

1- $4X = \cos^2 30 \tan^2 30 \tan^2 45$

2- $3 \tan X - 4 \sin^2 30 = 8 \cos^2 60$

…………………………………………………………………………………………

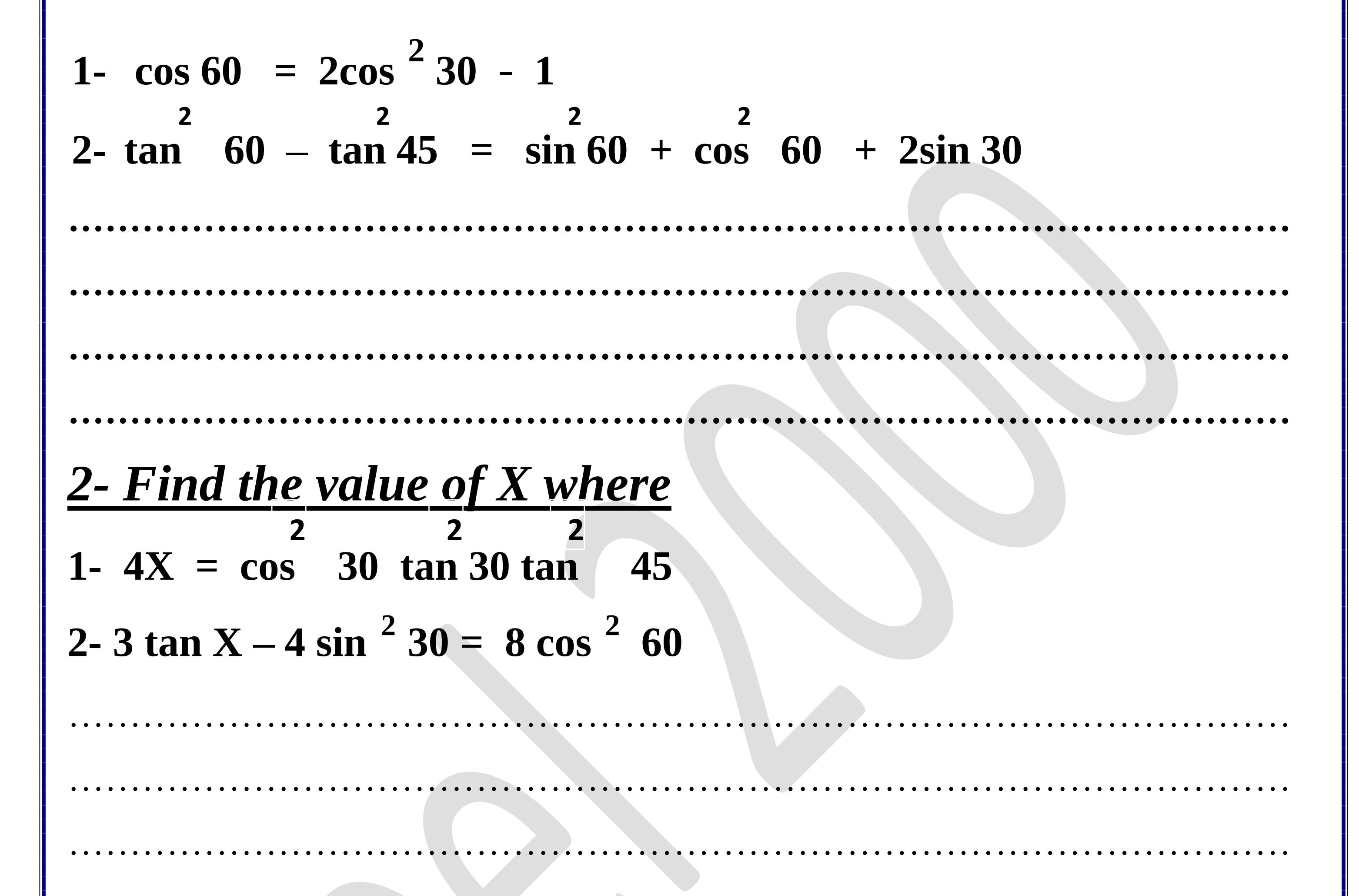
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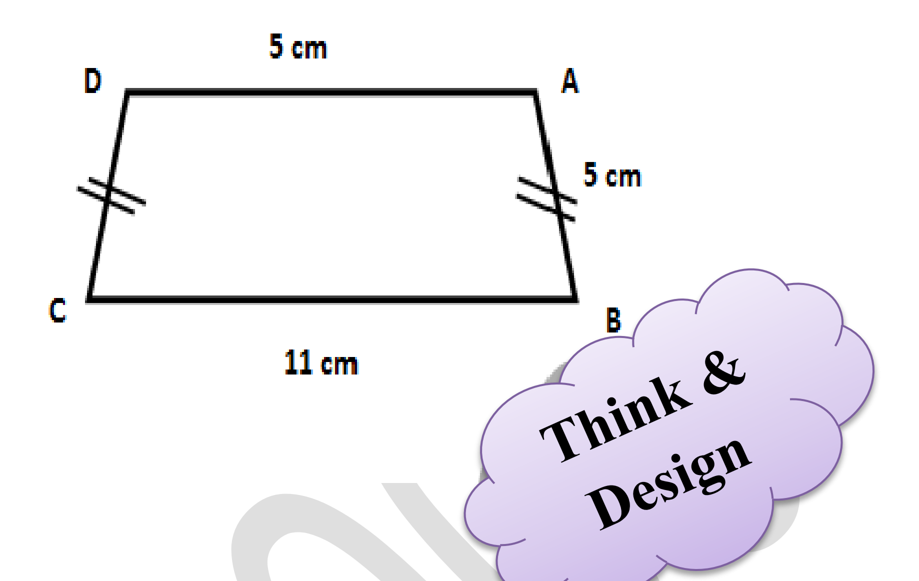


In the opposite figure Find

1. $\sin^2 C + \cos^2 B$

2. m < A

3. The area of Trapezium



....

....

....

....

....

Homework

1- prove that

1. $\tan 60 = \dfrac{2\tan 30^\circ}{1-\tan^2 30^\circ}$

2 . $\cos^2 60^\circ = 5\sin^2 30^\circ - \tan^2 45^\circ$

Q bank on unit 4

- **Complete :**

1) Sin(30) + Cos(60) – tan(45) = ……………………..
2) $Sin^2(45) + Cos^2(45)$ = ………………………………..
3) Tan(45) × Sin(30) = …………………………………
4) 4Cos(30)tan(60) = …………………………………..
5) Sin(30)Cos(60) + $Sin^2(60)$ = ………………………..

- **Without using the calculator , Prove that :**

1) Sin(60) = 2Sin(30)Cos(30)
2) Cos(60) = $2Cos^2(30) - 1$
3) $2Cos^2(30) - 1 = 1 - 2Sin^2(30)$
4) tan(60) = $\frac{2tan(30)}{1-tan^2(30)}$

- **Choose the correct answer :**

1) If Cos(X) = $\frac{1}{2}$, X is acute angle ,then $M(\hat{X})$ = …………. °

   (90 , 60 , 45 , 30)

2) If Sin(X) = $\frac{1}{2}$, X is acute angle ,then $M(\hat{X})$ = …………. °

   (90 , 60 , 45 , 30)

3) If Tan(X) = $\frac{1}{\sqrt{3}}$, X is acute angle , then Tan(2X) = …………

   (3 , 1 , $\sqrt{3}$, $\sqrt{2}$)

4) If 2Sin(X) = Tan(60) , X is acute angle , then $M(\hat{X})$ = …………. °

   (30 , 45 , 60 , 90)

- **Find the value of X in the following :**

  1) X $Sin^2(45)$ = $tan^2(60)$

  2) X Sin (30) $Cos^2(45)$ = $Sin^2(60)$

  3) Sin(X) = Sin(60)Cos(30) – Cos(60)Sin(30)

  4) 2Sin(X) = Sin(30)Cos(60) + Cos(30)Sin(60)

- **If tan(X) = $\frac{1}{\sqrt{3}}$, X is acute angle , Find the value of :**

  Sin(X) tan $(\frac{3X}{2})$ + Cos(2X) .

- **Δ ABC right angle triangle in B , M($\widehat{A}$) = 2 M($\widehat{C}$) ,**

  Find the value of : $Cos^2(A)$ + $tan^2(C)$.

- **ABCD rectangle , AB = 5 Cm , AC = 15 Cm , Find :**

  (1) M(ACB) . (2) the area of the rectangle ABCD .

- **ABCD <u>isosceles trapezoid</u> , AB = AD = DC = 5 Cm , BC = 11 Cm .**

  Find 1) M($\widehat{B}$) 2) M($\widehat{A}$) 3) the area of ABCD .

- **Δ ABC Equilateral triangle , AB = AC = 7 Cm , BC = 10 Cm**

  Find 1) M($\widehat{B}$) 2) the area of Δ ABC .

Test on unit four

- Choose the correct answer :

1) If Cos(2X) = $\frac{1}{2}$, then M($\hat{X}$) = …………………

(a)15 (b)30 (c)45 (d)60

2) If ΔABC right triangle in B , then Cos(A) + Cos(C) = …………….

(a)2Cos(C) (b)2Sin(B) (c)2Sin(A) (d)2Cos(A)

3) Sin(45) Cos(45) = ……………

(a)2 (b)1 (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

4) The triangle ABC right angle triangle in B , AB = $\frac{1}{2}$ AC , then Cos(A) = ………..

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{\sqrt{2}}$ (d) $\frac{1}{\sqrt{3}}$

5) The sum of the supplementary angles = ……………

(a)360 (b)270 (c)180 (d)90

6) In Δ ABC , Sin(A) = Cos(B) , then Δ ABC is …………..

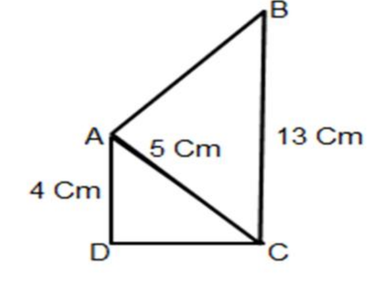
(a)obtuse angle triangle . (b)acute angles triangle .

(c)right angle triangle . (d)obtuse angle triangle and isosceles .

- If Tan(X) = 4Sin(30)Cos(30) , Find M($\hat{X}$) by degree .
- Without using calculator , Find the value of $\frac{Cos^2(60)+ Cos^2(30)+Tan^2(45)}{Sin(60)Tan(60)+Sin(30)}$
- In the corresponding figure , Find the value of :

  1) Tan($A\hat{B}C$) + Tan($A\hat{C}D$)

  2) Sin($\hat{B}$)Cos($C\hat{A}D$) + Cos($\hat{B}$)Sin($C\hat{A}D$)



- In Δ ABC right in B , AC = 5 Cm , BC = 4 Cm .

  Find the value of Sin(C) Cos(A) + Cos(C) + Sin(A)

Unit 5 objectives

1- Know rules of distance & coordinates of midpoint & slope

2- Solve exercises on equation of straight line

3- Connect with algebra

Learn & Think

1- If A (2 , - 4) , B (- 1 , 0) find length of $\overline{AB}$

AB = $\sqrt{(x_1 - x_2)2 + (y_1 - y_2)2}$ **= 5 length units.**

2- Represent graphically & determine type of the figure if

A (2 , 4) , B (-3 , 0) , C (-7 , 5) , D (-2 , 9) ?

……

……

……

……

Think & Answer

1. If A (-1 , -1) , B (2 , 3) , C (6 , 0) prove that ◺ABC is right& find its area

. . . .

. . . . …. . . . .

2- prove that A(3 , - 1) B (-4 , 6) & C (2 , -2) on same circle whose center is (-1 , 2) ?

....

....

....

3- If the distance between (-2 , 3) , (a , 7) is 5 l u. find a ?

....

....

4-prove that A(3 , - 1) B (-4 , 6) & C (2 , -2) on same circle whose center is (-1 , 2) ?

....

....

5- If the distance between (-2 , 3) , (a , 7) is 5 find a ?

....

....

....

6- Determine type of triangle ABC with respect to its angles

if A (5 , 3) , B (3 , - 2) , C (- 2 , - 4)?

....

....

7- If A (3 , 3) , B (0 , 3) , C (0 , 0) prove that ABC can be △

....

....

....

Remember that

Distance between 2 points is the length between them in shortest way (perpendicular distance)

Lesson : coordinates of midpoint

The main ideas :

\# **Midpoint** $= \left(\frac{x_1+x_2}{2} \; , \; \frac{y_1+y_2}{2} \right)$

1- If A (7 , - 4) , B (- 1 , 0) the coordinates of mid of $\overline{AB}$ …………………

Mid = $\left(\frac{x_1+x_2}{2} , \frac{y_1+y_2}{2}\right)$ = (3 , -2)

2- if A (3, 5) B (X , 1) & C (-1 , Y) If C is mid of AB find X & Y ?

………

………

………

Think & Answer

Evaluation

1- If C (2 , 0) is midpoint of $\overline{AB}$, A (3 , 1) , find B ?

………

………

………

………

………

2-Prove that A (2 , 4) , B (-3 , 0) , C (-7 , 5) , D (-2 , 9) are coordinates of Vertices of parallelogram ?

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

3- If A (3 , 2) , B (4 , - 3) , C (- 1 , - 2) are non collinear points , find d which makes ABCD is rhombus & find it's area ?

……………………………………………………………………………………………………

……………………………………………………………………………………………………

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4- If A (-1 , -1) , B (2 , 3) , C (6 , 0) prove that ◺ABC is right then find the Coordinates of vertex D which makes ABCD rectangle & find its area ?

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

Remember that :

Properties of parallelogram

1- …………………………… **2- ……………………………**

3- …………………………… **4- ……………………………**

Homework

1. **Prove that △ ABC is obtuse angled if A (5 , 3) , B (3 , - 2) , C (- 2 , - 4)**

   Find coordinates of vertex D which makes ABCD is parallelogram ?

……

……?

……

Think & Design

Activity :

…

On lattice represent A (-2 , 5) B (2, -1) then find coordinates of the midpoint ?

…

Lesson: the slope

The main ideas :

Rules :-

Slope(m) = tan θ

Where angle θ is the angle which the straight line makes with the positive direction of X - axis

Slope(m) = $\frac{y_1 - y_2}{x_1 - x_2}$ & the general equation :

Equation $y = mX + C$

Slope ← m ; C → **part of $\overleftrightarrow{yy}$ (c is the intercepted part from Y –axis)**

Learn & Think

Board summery

1- Find equation of staraight lone whose slope = 3 & cuts 5 units from positive direction of Y axis ?

Y= 3 X + 5

…………………………………………………………………………………

…………………………………………………………………………………

…………………………………………………………………………………

2- Find equation of straight line which passes through (2 , 3) , (- 1 , 4) ?

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

Think & Answer

Evaluation

1- Straight line whose equation $2x - 3y + 6 = 0$ Find the slope & the intercepted part of Y axis ?

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

2- Straight line whose slope = 2 & cuts 3 units in negative direction of Y axis find its equation?

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

3 - Find equation of straight line which passed through (3 , 1) & the perpendicular to straight whose equation $6x - 2y = 7$?

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

Homework

1- Find equation of the axis of symmetry of $\overline{AB}$ A (3 , 2) & B (- 1 , 1) ?

Q. Bank unit five

- **Choose the correct answer :**

1) The midpoint of $\overline{AB}$, such A(3,1) , B(-1,3) is ……………………

   ((4,-2) , (2,-1) , (2,4) , (-1,2))

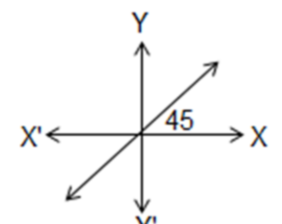
2) If $\overleftrightarrow{AB}$ // $\overleftrightarrow{CD}$ and the slope of $\overleftrightarrow{AB}$ = -2 , then the slope of $\overleftrightarrow{CD}$ = …………

   (-2 , $\frac{-1}{2}$, $\frac{1}{2}$, unknown)

3) The distance between the two points (2,0) , (5,0) is …………. Unit Length

   (7 , $\sqrt{29}$, $3\frac{1}{2}$, 3)

4) In the corresponding figure :



   The line equation is …………………


   (X = 1 , Y = 1 , Y = X , Y = -X)

5) ABCD Parallelogram , the slope of $\overleftrightarrow{AB}$ equal the slope of ……………

   ($\overleftrightarrow{AD}$, $\overleftrightarrow{AC}$, $\overleftrightarrow{BC}$, $\overleftrightarrow{DC}$)

6) The intersected part of the negative direction of Y-axis of the line

   3Y = 4X – 12 equal ………….. unit length .

   ($\frac{3}{4}$, 3 , 4 , -4)

7) The slope of the perpendicular to the line which passing (2,3) , (5,1) equal

   ……………….

   ($\frac{3}{2}$, $\frac{2}{3}$, $\frac{-3}{2}$, $\frac{-2}{3}$)

8) The perimeter of the circle with center (0,0) and passing through (3,4) equal

   …………. unit length .

   (5 π , 10 π , 25 π , 7 π)

9) The vertical length between Y- 3 = 0 , Y + 2 = 0 equal ………..

(5 , 1 , 2 , 3)

10) If $\frac{-2}{3}, \frac{K}{2}$ are slopes of two parallel lines , then K = ……………..

($\frac{-3}{4}$, $\frac{1}{3}$, $\frac{-4}{3}$, 3)

11) If M_1 , M_2 are slopes of two perpendicular lines , then $M_1 \times M_2$ = …………..

(-1 , 1 , 2 , Zero)

12) The distance between (3,4) and Y-axis = …………… unit length .

(5 , 3 , 4 , 7)

13) The line Y-2X-5=0 intersect of positive direction of Y-axis part which length = …………… unit length .

(2 , 5 , 7 , 10)

14) If $\overline{AB}$ is a diameter in a circle such that A(-1,5) , B(3,1),then the center of this circle is …………

((2,6) , (1,3) , (4,-4) , (-4,4))

15) The slope of $\overleftrightarrow{AB} = \frac{1}{3}$, $\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$, the slope of $\overleftrightarrow{CD}$ = …………..

($\frac{1}{3}$, $-\frac{1}{3}$, 3 , -3)

16) The line equation which passing through (3,-2) and parallel to Y-axis is ….

(X = 3 , Y = - 2 , X = - 2 , Y = 3)

17) The slope of the line which parallel to Y-axis = …………….

(Zero , 1 , -1 , unknown)

18) The slope of the line 3X-4Y+12=0 is ……………

($\frac{3}{4}$, $\frac{-3}{4}$, $\frac{4}{3}$, $\frac{-4}{3}$)

19) The distance between (3,-4) and the X-axis equal …………… Unit length .

(-3 , 4 , -4 , 3)

20) If X-axis divided $\overline{AB}$ into two halves , A(3,2) and B(-2,Y) , then Y = ………..

(3 , 2 , -2 , 4)

Second : Essay exercises

(1) ABCD quadrant shape , A(-1,1) , B(0,5) ,C(5,6) , D(4,2) . Prove that ABCD is parallelogram .

(2) Find the equation of the line which passing through (3,2) , (2,3) .

(3) If the line which passing through (3,0) , (0,a) and the line X-Y+1=0 are perpendicular , Find the value of a .

(4) Prove that the triangle which vertex are A(1,-2) , B(-4,2) , C(1,6) is isosceles

(5) ABCD rhombus its vertex are A(3,2) , B(4,-3) , C(-1,-2) , D(-2,3) , Find its surface area .

(6) ABCD parallelogram , its diameters are intersect in H such that , A(3,-1) , B(6,2) , C(1,7) , Find the coordinates of H and D .

(7) Prove that A(-1,5) , B(1,2) , C(3,-1) are collinear .

(8) Find the equation of the line which passing through (4,5) and parallel to X – 2Y – 7 = 0 .

(9) Find the type of the triangle LMN with respect to its sides such that L(-2,4) , M(3,-1) , N(4,5) .

(10) Prove that A(3,-1) , B(-4,6) , C(2,-2) located on the circle which center is M(-1,2) and then find its perimeter .

(11) Find the equation of the line which passing through (3,-5) and perpendicular to X + 2Y – 7 = 0 .

(12) Prove that the line which passing through (2,-1) , (6,3) is parallel to the line which make a positive angle 45° with the positive direction of X-axis .

(13) If C(4,Y) is the midpoint of $\overline{AB}$ such that A(X,3) , B(6,5) , Find the value of X , Y .

(14) Prove that the triangle which vertex A(4,3) , B(-3,2) , C(3,0) is a right angle triangle in C , and then find the coordinates of the vertex which make ABCD a rectangle .

(15) Prove that the line which passing through A(3,1) , B(1,2) is parallel to the line 2X + 4Y – 3 = 0 .

(16) If the triangle with vertex X(3,5) , Y(4,2) , Z(-5,A) is right angle triangle in Y , Find the value of A .

(17) If the equations of the lines L_1 , L_2 respectively are 6X + kY – 3 = 0 , 2X – 3Y + 6 = 0 , Find the value of k which make the lines :

1- Parallel . 2- Perpendicular .

(18) If the distance between (a,7) , (0,3) equal 5 , Find the value of a .

(19) ABC triangle , $\overline{AB} \perp \overline{BC}$, A(4,1) , B(-2,-1) , Find :

1- The slope of $\overleftrightarrow{AB}$. 2- The equation of $\overleftrightarrow{BC}$.

(20) $\overline{AD}$ is a median in Δ ABC , M is a midpoint of $\overline{AD}$, M(0,6) , B(3,2) , C(-3,6) Find the coordinates of the point A .

Test on unit five

- **Choose the correct answer :**

  1) **The line 2X – 3Y – 6= 0 intersect form the Y-axis part its length ………..**

     (-6 , -2 , $\frac{2}{3}$, 2)

  2) **If 3X – 4Y – 3 =0 , kY + 4X – 8 = 0 are perpendicular , then k = ………..**

     (-4 , -3 , 3 , 4)

  3) **The area of Δ which specified by the lines 3X – 4Y = 12 , X = 0 , Y = 0 equal ………….**

     (6 , 7 , 12 , 5)

  4) **The lines Y = 3X – 5 , 2Y = 6X + 5 are …………………**

     (parallel , intersect and not perpendicular , perpendicular , equivalent)

- **Find the equation of the line which cut from x-axis and Y-axis two parts equal 4 , 6 units respectively .**
- **ABCD rhombus , A(1,3) , C(6,0) , Find the equation of the line $\overleftrightarrow{BD}$.**
- **Δ ABC such that A(3,-1) , B(x,3) , C(5,3) is right angle triangle in A , Find x .**
- **If C(6,-4) is the midpoint of $\overline{AB}$ such that A(5,-3) , Find the coordinates of the point B .**

Model tests

on

Geometry

- **Choose the correct answer :**

(1) ABCD parallelogram , the slope of $\overleftrightarrow{AB}$ equal the slope of …………

($\overleftrightarrow{AC}$, $\overleftrightarrow{AD}$, $\overleftrightarrow{BC}$, $\overleftrightarrow{DC}$)

(2) The length of the intersected part of the negative direction of Y-axis by the line 3Y = 4X – 12 equal …………. Unit length .

($\frac{4}{3}$, 3 , 4 , -4)

(3) The slope of the perpendicular to the line which passing through (2,3) , (5,1) equal ………………

($\frac{3}{2}$, $\frac{2}{3}$, $\frac{-3}{2}$, $\frac{-2}{3}$)

(4) If X , Y are complementary angels , Sin(X) = $\frac{3}{5}$, then Cos(Y) = ……..

($\frac{4}{5}$, $\frac{3}{5}$, $\frac{3}{4}$, $\frac{5}{3}$)

(5) The perimeter of the circle with center (0,0) and passing through (3,4) equal …………….. unit length .

(5 π , 10 π , 25 π , 7 π)

(6) The slope of the line which make a positive angle H with the positive direction of X-axis equal ……………

(Sin(H) , Cos(H) , $\frac{Sin(H)}{Cos(H)}$, Sin(H) + H)

- (A) without using calculator , Prove that : $Tan^2(60) - Tan^2(45) = 4\ Sin(30)$.

  (B) ABCD rhombus : A(3,2) , B(4,-3) , C(-1,-2) , D(-2,3) , Find its surface area .

(A) ABC right angle triangle in B , AB = 5 Cm , BC= 12 Cm , Find the value of :

Sin(C) + Cos(C) .



(B) ABCD parallelogram , its diameters are intersect in H such that , A(3,-1) , B(6,2) , C(1,7) , Find the coordinates of H and D .

- (A) find the value of X : X is acute angle

  Sin(X) = Sin(60)Cos(30) – Cos(60)Sin(30)

  (B) prove that A(-1,5) , B(1,2) , C(3,-1) are collinear .

- (A) find the equation of the line which passing through (4,5) and parallel

  $X - 2Y - 7 = 0$.

  (B) find the type of Δ LMN with respect to its sides , L(-2,4) , M(3,-1) , N(4,5) .

Geometry Model

(1) <u>Choose :</u>

1) $\overline{CD}$ 2) 4   3) $\frac{3}{2}$ 4) $\frac{3}{5}$ 5) 10π 6) $\frac{Sin\ H}{Cos\ H}$

---

(2) A)

L . H . S	R . H . S
$Tan^2(60) - Tan^2(45) = 2$	$4\ Sin(30) = 2$

B) AC = $\sqrt{(3 - -1)^2 + (2 - -2)^2}$ = $4\sqrt{2}$ L . Unit

BD = $\sqrt{(4 - -2)^2 + (-3 - 3)^2}$ = $6\sqrt{2}$ L . Unit

Area = $\frac{1}{2} \times 4\sqrt{2} \times 6\sqrt{2}$ = 24 Square Unit

---

(3) A) Acs $\sqrt{(12)^2 + (5)^2}$ = 13 Cm

Sin (C) = $\frac{5}{13}$, Cos (C) = $\frac{12}{13}$

Sin (C) + Cos (C) = $\frac{5}{13} + \frac{12}{13} = \frac{17}{13}$

B) H = (2,3)   ∴ D = (-2,4)

---

(4) A) X = 30

B) LM = $5\sqrt{2}$, LN = $\sqrt{37}$, MN = $\sqrt{37}$

∴ Δ is isosceles .

Geometry

Model (2)

- **Choose the correct answer :**

(1) In Δ ABC , if M($\widehat{A}$) + M($\widehat{B}$) = 110° , then M($\widehat{C}$) = …………

(110 , 90 , 70 , 50)

(2) tan(45) = …………..

($\sqrt{3}$, $\frac{1}{\sqrt{3}}$, $\frac{1}{2}$, 1)

(3) ABCD square , then M(C$\widehat{A}$B) = …………..

(90 , 45 , 60 , 30)

(4) The vertical distance between the lines Y – 3 = 0 , Y + 2 = 0 equal ……….

(5 , 1 , 2 , 3)

(5) The measure of the exterior angle from the vertex of the equilateral triangle equal …………….

(60 , 150 , 120 , 30)

(6) $\frac{-2}{3}$, $\frac{k}{2}$ are slopes of two parallel lines , then k = …………..

($\frac{-3}{4}$, $\frac{1}{3}$, 3 , $\frac{-4}{3}$)

- **(A) without using calculator , Prove that :**

Cos(60) = $Cos^2(30) - Sin^2(30)$.

(B) prove that A(3,-1) , B(-4,6) , C(2,-2) located on a circle with center M (-1,2) and then find the perimeter of this circle .

- **(A) find the equation of the line which passing through (3 , -5) and perpendicular to the line X + 2Y – 7 = 0 .**

  (B) Find the value of X : 4X = $Cos^2(30)Tan^2(30)Tan^2(45)$

- **(A) By using the slope , Prove that A(-1,3) , B(5,1) , C(6,4) , D(0,6) are vertex of rectangle .**

  (B) prove that the line which passing through (2,-1) , (6,3) is parallel to the line which make a positive angle 45° with the positive direction of X-axis .

- **(A)ABC triangle , AB = AC = 10 Cm , BC = 12 Cm , drawn $\overrightarrow{AD} \perp \overline{BC}$**

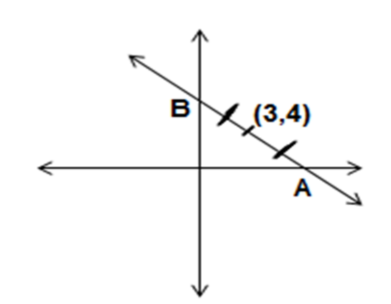
$\overrightarrow{AD} \cap \overline{BC}$ = { D }

- **Prove that : $Sin^2(C) + Cos^2(C) = 1$**

  (B) in the corresponding figure :

  C (3,4) is the midpoint of $\overline{AB}$,

  Find the perimeter of Δ CAB .



Geometry

Model (3)

- **Choose the correct answer :**

(1) If $L_1 // L_2$, $L_3 \perp L_1$, $L_4 \perp L_2$, then ………….

($L_1 // L_2$, $L_1 // L_4$, $L_3 // L_4$, $L_4 \perp L_2$)

(2) The vertical distance between the lines Y + 1 =0 , Y + 3 = 0 equal ….. unit.

(4 , 2 , 1 , 5)

(3) The points (0,0) , (3,0) , (0,4) ……………………….

(make an obtuse angle triangle , make an acute angles triangle , make a right angle triangle , are collinear)

(4) A circle with center (0,0) and its radius = 2 unit length , which point belong to this circle ? ……..

((1,2) , (-2,1) , ($\sqrt{2}$,1) , ($\sqrt{3}$,1))

(5) The slope of the line which make positive angle 45° with the positive direction of X-axis equal ………….

(1 , -1 , Zero , 2)

(6) In Δ ABC ,if M($\widehat{A}$) = 85° , Sin(B) = Cos(B) , then M($\widehat{C}$) = …………

(30° , 45° , 50° , 60°)

- **(A) ABCD quadrant shape : A(2,4) , B(-3,0) , C(-7,5) , D(-2,9) , prove that ABCD is a square .**

  (B) prove that : $Cos^2(45°) + Tan^2(60°) – Sin(30°) = 3$

- **(A) Find the value of X , if $\sin(X) = \sin(60°)\cos(30°) - \cos(60°)\sin(30°)$**

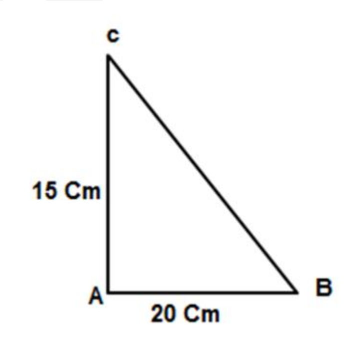
  Such that : $0 < X < 90°$

  (B) Prove that A(-2,5) , B(3,3) , C(-4,2) are not collinear .

- **(A) in the corresponding figure :**

  ABC triangle , $M(\hat{A}) = 90°$, AC = 15 Cm , AB = 20 Cm

  Prove that : $\cos(C)\cos(B) - \sin(C)\sin(B) = $ Zero .



  (B) Find the equation of the line which passing through (4,2) , (-2,-1) , then prove that this line passing through the origin .

- **(A) if A(X,3) , B(3,2) , C(5,1) , and AB = BC , then find the value of X .**

  (B) the equations of L_1 , L_2 are respectively $2X - 3Y + 1 = 0$, $3X + bY - 6 = 0$

  Then find the value of be if :

  1- $L_1 // L_2$. **2- $L_1 \perp L_2$.**

Geometry

Model (4)

- **Choose the correct answer :**

(1) If Sin(2X) = 0.5 , X is acute angle , then M($\hat{X}$) = ………… °

(70 , 60 , 15 , 30)

(2) M_1 , M_2 are the slopes of two perpendicular lines , then $M_1 \times M_2$ = ……….

(-1 , 1 , 2 , Zero)

(3) If M($\hat{B}$) = 90° , M($\hat{A}$) = 60° , AC = 20 Cm . , then AB = ………..

(20 , 10 , 20 , 5)

(4) The distance between (3,4) and the Y-axis is ………… unit length .

(5 , 3 , 4 , 7)

(5) The line Y – 2X – 5 = 0 , cut from the positive direction of Y-axis part its length ……… unit length .

(2 , 5 , 7 , 10)

(6) If (3,6) satisfy the relationship Y = k X , then k = ………….

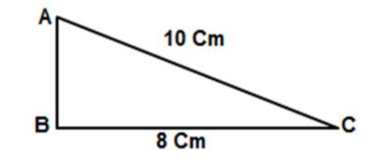
(12 , 9 , 3 , 1)

- **(A) find the equation of line with slope $\frac{2}{3}$ and passing through (-3 , 7)**

  (B) prove that 4Sin(30) + Tan^2(45) = Tan^2(60) , without using the calculator .

- **(A) if C(4,y) is the midpoint of $\overline{AB}$: A(x,3) , B(6,5) , find the value of x , y .**

  (B) in the corresponding figure :



Δ ABC is right angle triangle in B

, AC = 10 Cm , CB = 8 Cm .

Find : 1- the length of $\overline{AB}$ 2- Sin(C)Cos(A) + Sin(A)Cos(C)

- (A) prove that the line which passing through (4,3) , (0,2) is parallel to the line which make angle 45 with positive direction of X-axis .

  (B) prove that Δ which vertex A(1,1) , B(0,4) , C(-1,1) is isosceles .

- (A) find the equation of the line which passing through (3,4) and perpendicular to the line $5X - 2Y + 7 = 0$.

  (B) ABCD rectangle , AB = 5 Cm , BC = 12 Cm .

  Find :

  1 - M $(A\hat{C}B)$

  2 - 2 tan (ACB) tan (BAC) .